APPENDIX D-1:
Summary of Model Input and Output Data for All Alternatives and Flow Scenarios

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Action Alternatives	Alternative 1 New 80 cfs Pump on Okanogan			Alternative 2 Upgrade Shellrock to 35 cfs			Alternative 3 5100 ac-ft Water rights Purchase			Alternative 4 No Action	
Channel Condition	**Channel Rehabilitation**		**No Channel Rehab**	**Channel Rehabilitation**		**No Channel Rehab**	**Channel Rehabilitation**		**No Channel Rehab**	**No Channel Rehab**	
Flow Scenarios	***Steelhead Only***	***Steelhead and Chinook***	***Steelhead Only***	***Steelhead Only***	***Steelhead and Chinook***	***Steelhead Only***	***Steelhead Only***	***Steelhead and Chinook***	***Steelhead Only***	***None***	
EXISTING SYSTEM FACILITIES											
System Reservoir Storage Capacity											
Conconully Reservoir active storage	13000	13000	13000	13000	13000	13000	13000	13000	13000	13000	ac-ft
Salmon Lake Reservoir active storage	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	ac-ft
Total system storage:	23500	23500	23500	23500	23500	23500	23500	23500	23500	23500	ac-ft
Combined Minimum Storage For Model Run (must be > 0)	*13568*	*2223*	*11898*	*180*	*346*	*661*	*3150*	*428*	*2824*	*1748*	ac-ft
Reservoirs											
Feeder canal capacity	90	90	90	90	90	90	90	90	90	30	cfs
Percent of reservoir release from Conconully	55.0%	63.0%	55.0%	55.0%	54.6%	55.0%	57.0%	54.0%	57.0%	60.0%	
Percent of reservoir release from Salmon Lake	45.0%	37.0%	45.0%	45.0%	45.4%	45.0%	43.0%	46.0%	43.0%	40.0%	
Shellrock Pumping Rules											
Installed capacity	0	0	0	35	35	35	25	25	25	25	cfs
Maximum pump rate, warm years	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	
Minimum pump rate, cool years	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	
Stop pumping for year if spill occurs?	No	No	No	No	No	No	No	No	No	Yes	
Critical system storage for maximum pumping	0	0	0	15000	15000	15000	15000	15000	15000	9500	ac-ft
Cut back pumping during WAC restriction?	No	No	No	No	No	No	No	No	No	No	
Maximum pump rate under water right	0	0	0	35	35	35	35	35	35	35	cfs
Duck Lake Pumping Rules											
Installed capacity	10	10	10	10	10	10	10	10	10	10	cfs
Maximum pump rate, warm years	5%	5%	5%	60%	100%	65%	5%	100%	5%	5%	
Minimum pump rate, cool years	5%	5%	5%	60%	100%	65%	5%	100%	5%	5%	
Maximum Duck Lake elevation:	1232.00	1232.00	1232.00	1232.00	1232.00	1232.00	1232.00	1232.00	1232.00	1232.00	feet
Minimum Duck Lake elevation:	1226.75	1226.75	1226.75	1226.75	1226.75	1226.75	1226.75	1226.75	1226.75	1226.75	feet
Okanogan River Pumping Rules											
Maximum Pump Rate Design	80.0	80.0	80.0	0	0	0	0	0	0	0	
Maxiumum Pumping Required During Drought Years	57.3	43.0	52.4	0	0	0	0	0	0	0	cfs
Okanogan River downstream of Salmon Creek	0	0	0	0	0	0	0	0	0	0	cfs
Cut back pumping during WAC restriction?	No	No	No	No	No	No	No	No	No	No	
Maximum pump rate under water right	35	35	35	35	35	35	0	0	0	35	cfs

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OID IRRIGATION DEMAND											
Duck Lake Retained Storage for Artificial Groundwater Recharge											
Annual quantity	500	500	500	500	500	500	500	500	500	500	ac-ft/yr
Irrigation Water Demand											
Crop Irrigation Requirement, warm years	11,350	11,350	11,350	11,350	11,350	11,350	7,718	7,718	7,718	11,350	ac-ft/yr
On-farm efficiency:	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	ac-ft/yr
Maximum irrigation delivery:	17,196	17,196	17,196	17,196	17,196	17,196	11,694	11,694	11,694	17,196	ac-ft/yr
Crop Irrigation Requirement, cool years	10,701	10,701	10,701	10,701	10,701	10,701	7,277	7,277	7,277	10,701	ac-ft/yr
On-farm efficiency:	85%	85%	85%	85%	85%	85%	85%	85%	85%	85%	ac-ft/yr
Minimum irrigation delivery:	12,590	12,590	12,590	12,590	12,590	12,590	8,561	8,561	8,561	12,590	ac-ft/yr
Irrigation Efficiency:											
Conveyance loss:	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	
Operational spill to Duck Lake (see Table 3.1-D-1):	distributed monthly	distributed monthly	distributed monthly	distributed monthly	distributed monthly	distributed monthly	distributed monthly	distributed monthly	distributed monthly	distributed monthly	
INSTREAM FLOW DEMAND AND MODEL RESULTS											
Lower Reach Losses											
Lower Reach - above Watercress Springs	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	
Lower Reach - below Watercress Springs	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	
Salmon Creek Instream Flow											
Middle Reach (above weir)											
Specified flow schedule (exclusive of lower reach)	5968	8882	5968	5968	8882	5968	5968	8882	5968	0	ac-ft/yr
Modeled average annual flow	22650	22666	22651	22661	22670	22587	22653	22669	22653	22730	ac-ft/yr
Modeled minimum actual flow	5290	8139	5835	8116	7862	8089	7672	8648	7672	5424	ac-ft/yr
Salmon Creek at weir											
Modeled average annual flow	17342	16990	17163	15592	16706	15636	17202	18606	17208	10501	ac-ft/yr
Modeled minimum actual flow (should be 5100 for EIS*)	5100	6435	5100	5100	6417	5100	5100	7565	5100	448	ac-ft/yr

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Lower Reach (at mouth)											
Specified flow schedule (exclusive of upper reach)	2059	4317	2644	3808	4319	3774	3748	4317	3747	0	ac-ft/yr
Modeled average annual flow	13693	13415	13552	12311	13191	12346	13582	14691	13588	8292	ac-ft/yr
Modeled minimum actual flow	4027	5081	4027	4027	5067	4027	4027	5973	4027	354	ac-ft/yr
AVERAGE ANNUAL MODEL OUTPUT											
Firm Yield at Mouth of Salmon Creek	4027	5081	4027	4027	5067	4027	4027	5973	4027	354	
Salmon Creek diversion to OID Canal	5308	5676	5488	7069	5964	6951	5452	4064	5445	12229	ac-ft/yr
Canal spill and seepage loss	-1810	-1822	-1819	-1054	-1015	-1046	-700	-834	-697	-1396	ac-ft/yr
Shellrock pumping	0	0	0	7153	7442	7173	4672	5092	4679	2414	ac-ft/yr
Duck Lake pumping	1355	1412	1383	1003	977	999	555	806	552	1101	ac-ft/yr
New Okanogan River pumping	9491	9079	9293	0	0	0	0	0	0	0	ac-ft/yr
Critical period shortage	0	0	0	0	41	0	0	9	0	0	ac-ft/yr
Total Water Delivered to Farms	14345	14345	14345	14171	13410	14077	9979	9137	9979	14348	ac-ft/yr
Total Demand From System	16155	16167	16164	15225	14425	15123	10679	9972	10676	15745	ac-ft/yr
Delivery Efficiency	89%	89%	89%	93%	93%	93%	93%	92%	93%	91%	
On-Farm Efficiency	77%	77%	77%	78%	82%	78%	75%	82%	75%	77%	
Overall District Efficiency	68%	68%	68%	72%	76%	73%	70%	75%	70%	70%	
Total system capacity shortage	0	0	0	0	10	0	0	5	0	0	cfs maximum
	0	0	0	0	1698	0	0	674	0	0	ac-ft/yr maximum
Critical Storage Level	0	0	0	0	9000	0	0	5000	0	0	ac-ft

* Note - due to model structure and governing rules for the order of calculations, the flows over the weir could not be reduced to 5100 ac-ft per year without also reducing the lower reach instream flows below specified flow demands. In essence, during certan times of the year flow over the weir is controlled more by lower reach demands than middle reach demands when OID demands are also being met. A minor but still signficant amount of model restructuring would be necessary to correct the order of calculations, and achieve the EIS target volume of 5100 ac-ft.